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Fertilizers and soil conditioners — Determination of arsenic, cadmium, chromium, lead and mercury contents

Matières fertilisantes — Détermination de l'arsenic, du cadmium, du plomb, du chrome et du mercure dans les engrais

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Foreword

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The committee responsible for this document is ISO/TC 134, *Fertilizers and soil conditioners.*

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Fertilizers and soil conditioners — Determination of arsenic, cadmium, chromium, lead and mercury contents

1 Scope

This International Standard specifies the test methods for determination of metals soluble in nitric acid: arsenic, cadmium, chromium, lead, and mercury contents in fertilizers.

This International Standard is applicable to the analysis of arsenic, cadmium, chromium, lead, and mercury contents in fertilizers. Special attention should be given when analysing some micro-nutrients fertilizers.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

3 Principle

Arsenic, cadmium, chromium, lead, and mercury in the test portion are extracted by means of nitric acid digestion in a microwave digestion system. The digested solution will be measured by inductively coupled plasma – optical emission spectroscopy (ICP-OES). Indium will be used as internal standard substance when chromium or lead is determined.

NOTE An internal standard is recommended for metals to correct for solution matrix differences between the calibration standards and the fertilizer digests, any other internal standard materials with equal effect could be utilized, provided none of these are contained in the fertilizer samples.

4 Reagents

WARNING — Nitric acid is corrosive and oxidizer. The related operations shall be performed in fume hood. This standard does not point out all possible safety problems, and the user shall bear the responsibility to take proper safety and health measures, and ensure the operations compliant with the conditions stipulated by the related laws and regulations of the state.

Use only reagents of recognized analytical grade, and water conforming to grade 3 of ISO 3696:1987.

4.1 Nitric acid, d = 1,40 g/ml, recommend to use trace element grade nitric acid.

4.2 Nitric acid solution, add 1 volume of nitric acid to 9 volume of water.

4.3 Standard stock solution of arsenic, cadmium, chromium, lead, mercury, 1 000 mg/l certificated substance.

4.4 Indium standard stock solution, 1 000 mg/l.

Weigh $In(NO_3)_3 \times H_2O$ [containing 0,262 0 g $In(NO_3)_3$] to a 100 ml beaker, dissolved by nitric acid solution (4.2), then transfer to a 100 ml volumetric flask, fill to the mark with nitric acid solution (4.2), and mix.

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